No. 891,219. PATENTED JUNE 16, 1908.

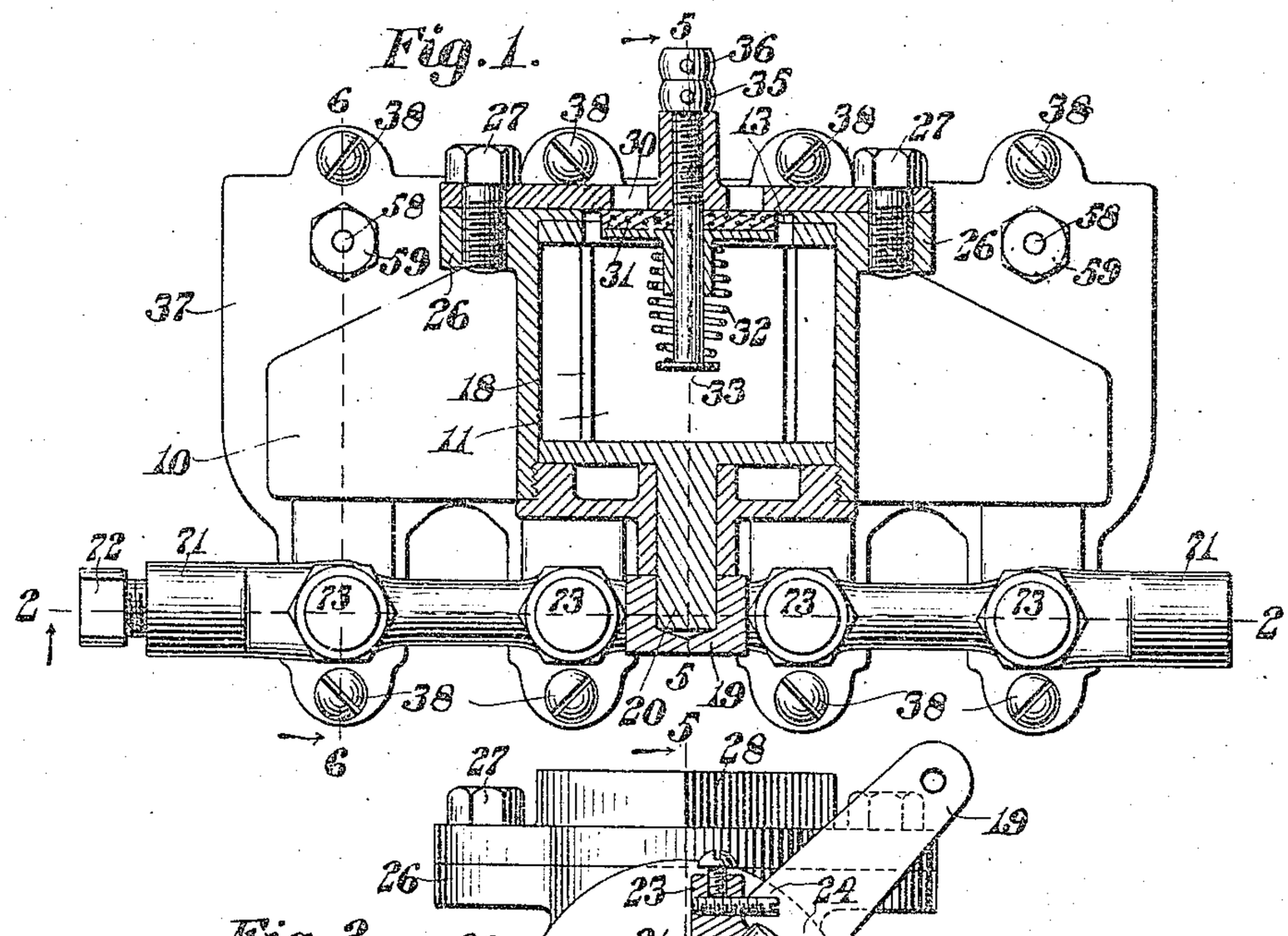
A. W. MENNS.

CARBURETER.

APPLICATION FILED MAR. 6, 1907.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Nathan C. Lombard

Howard Hanscom

Inventor:

Albert W. Menns,

by Walter E. Lombard.

Atty.

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3 SHEETS—SHEET 2.

Fig. 3.

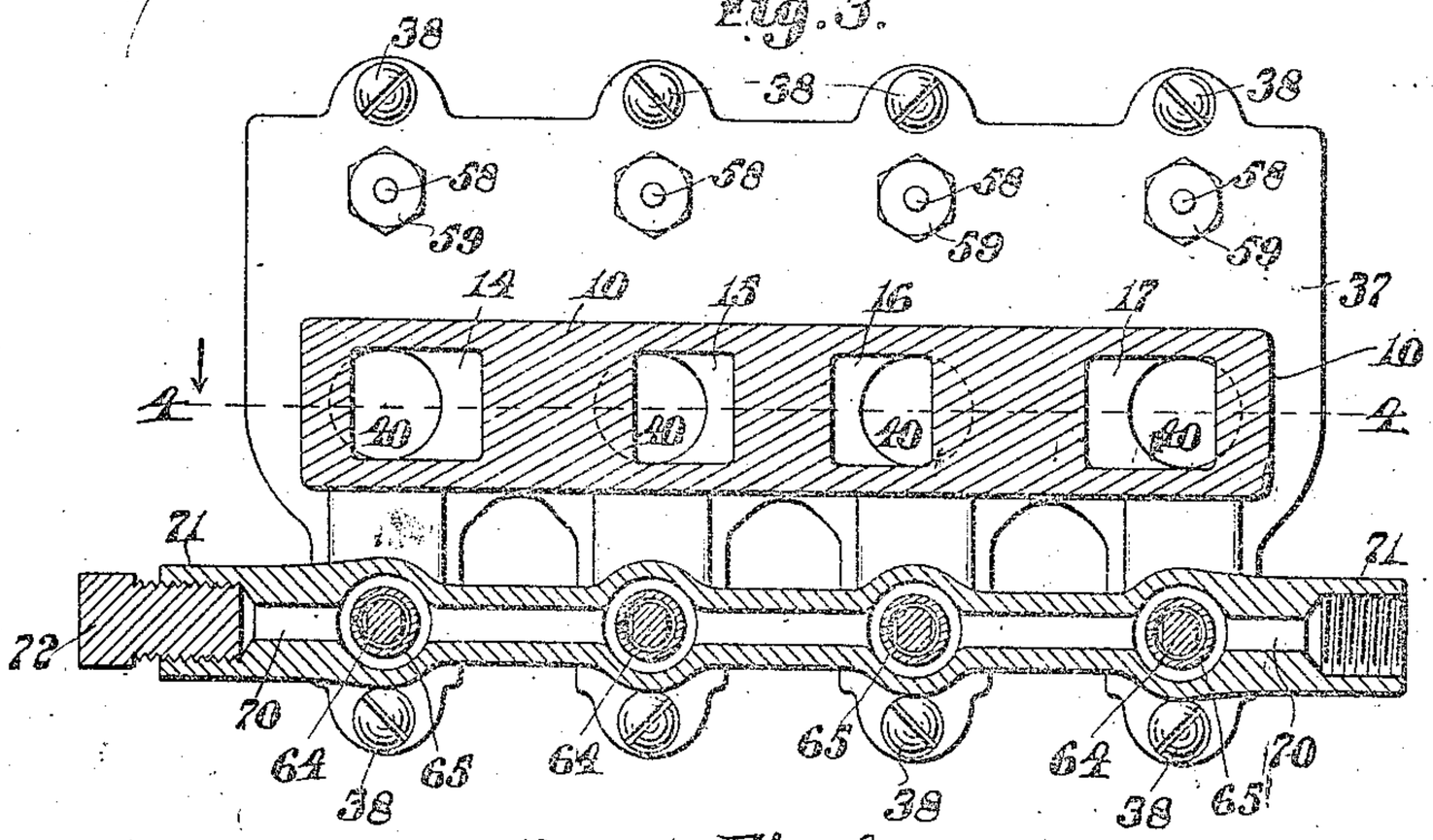
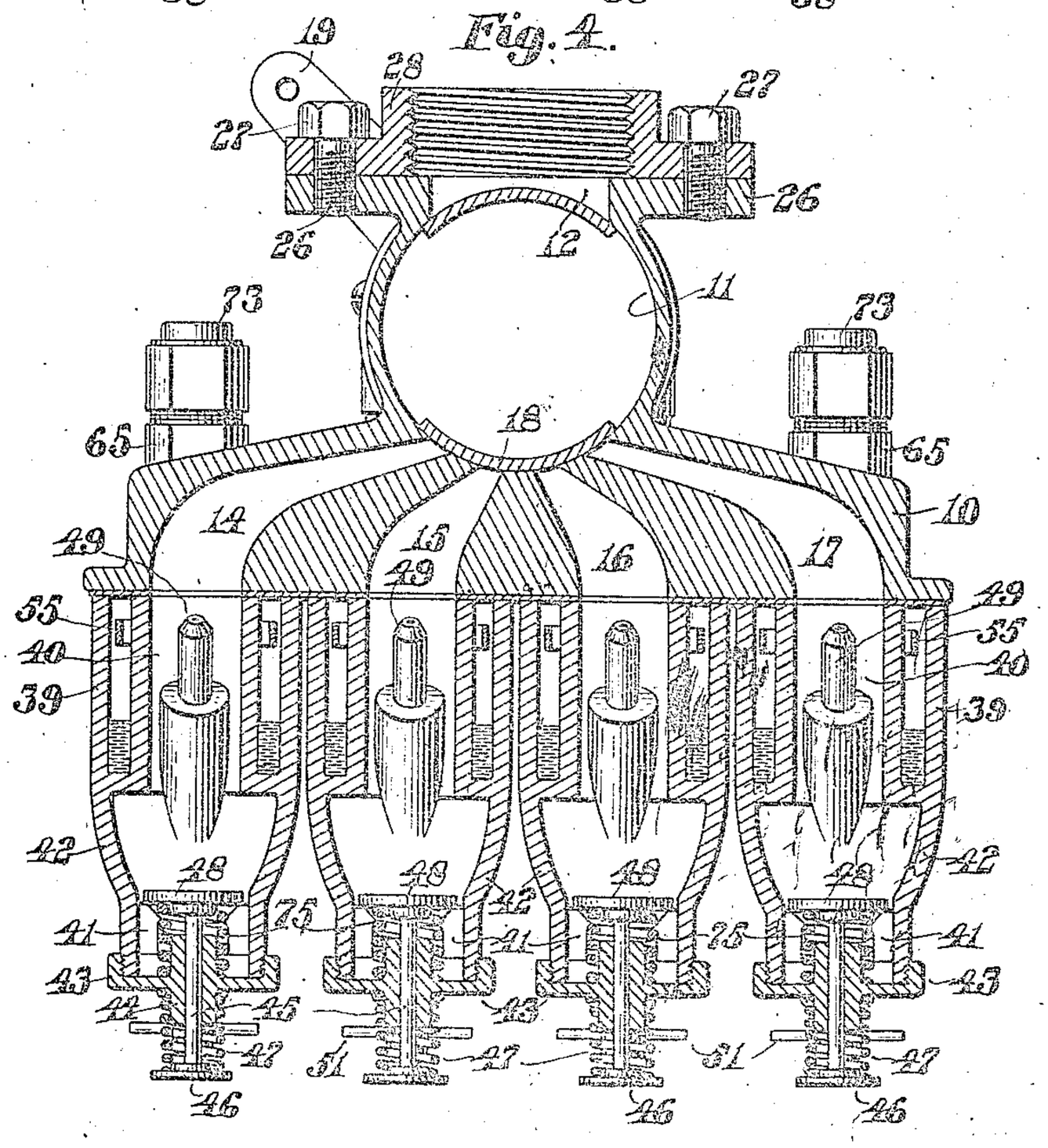


Fig. 4.



Witnesses:
Nathan C. Lombard
Howard Haveson

Inventor:
Albert W. Menns,
by Nath'l E. Lombard,
Atty.

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3 SHEETS—SHEET 3.

Fig. 5.

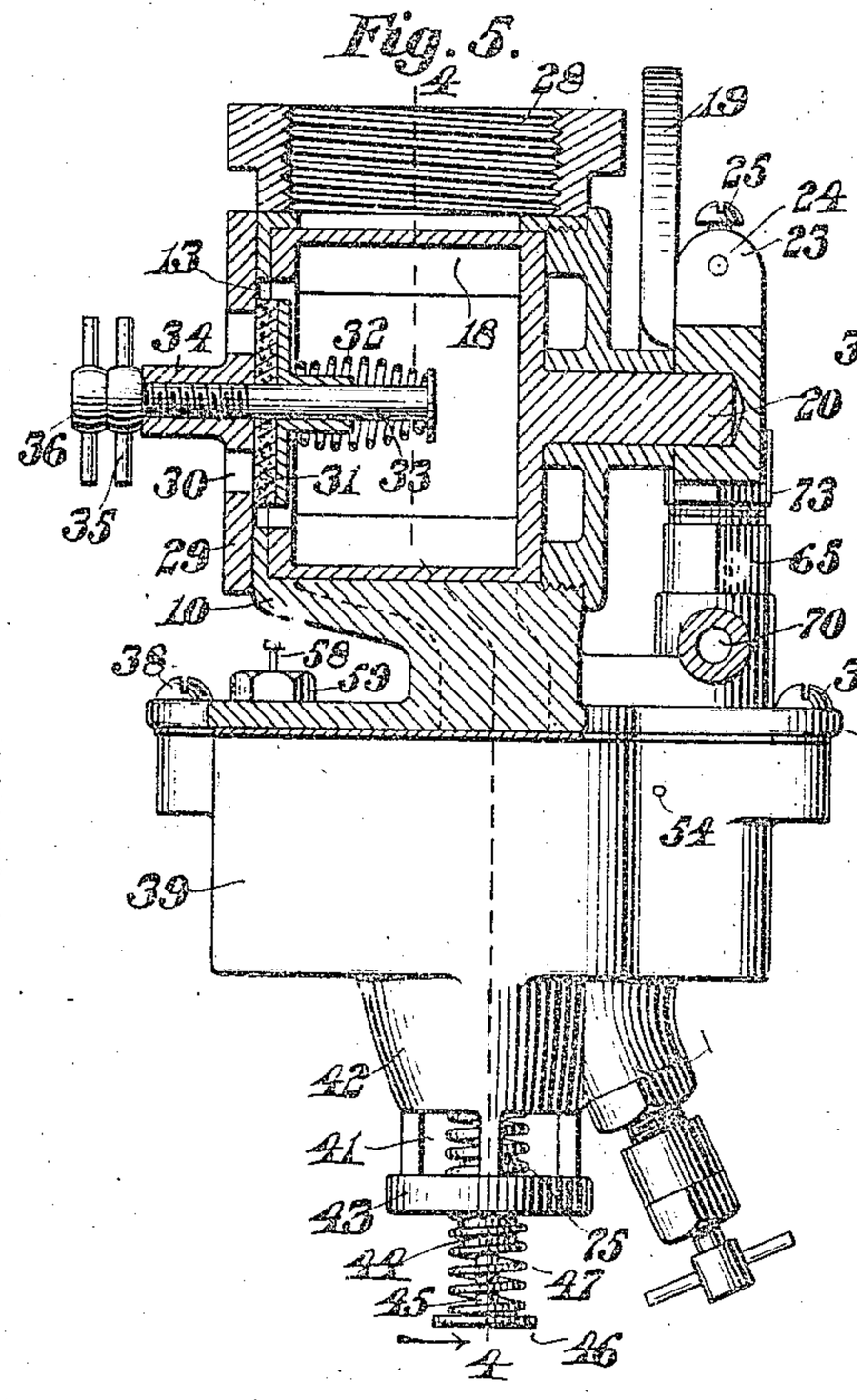


Fig. 6.

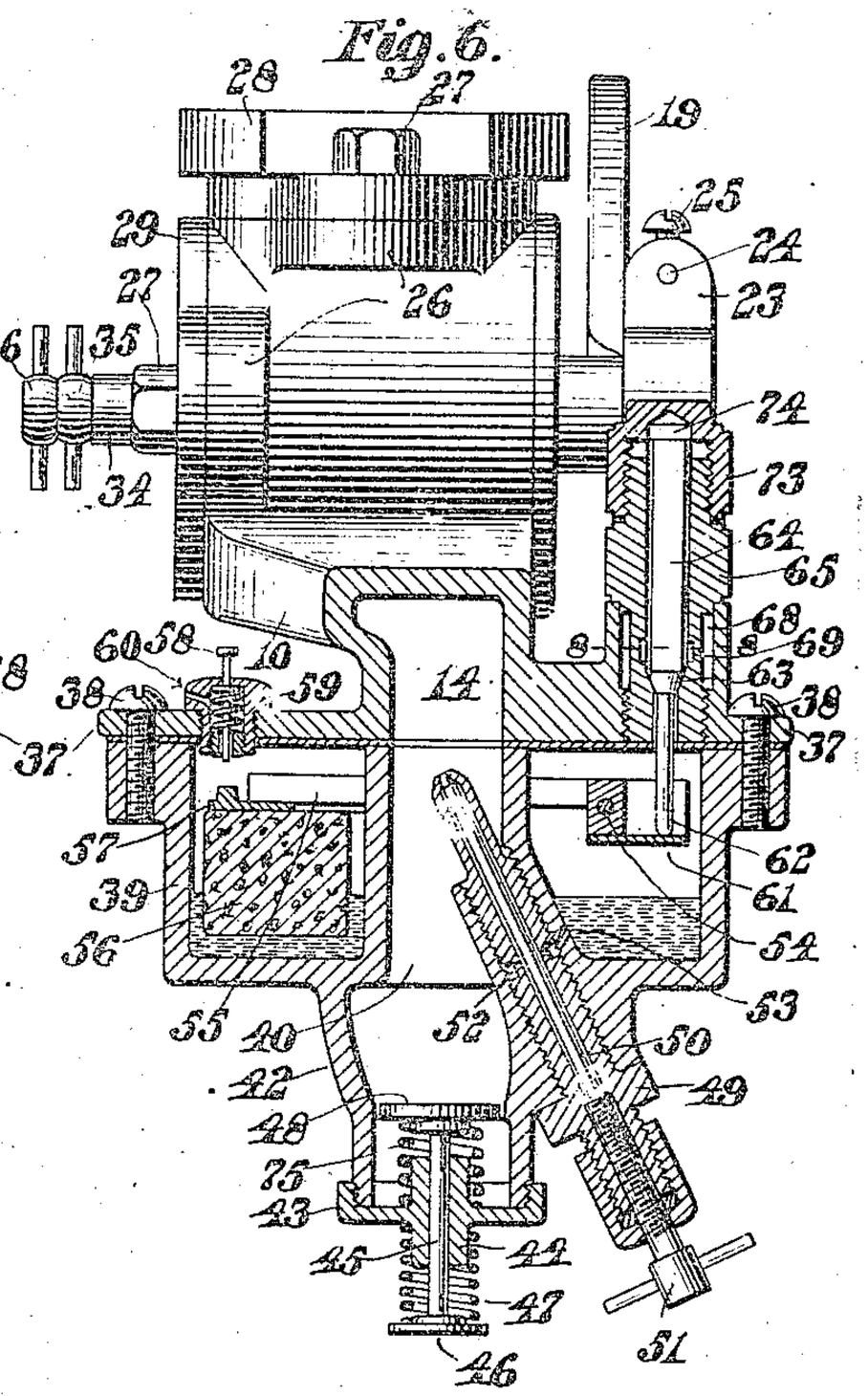


Fig. 9.

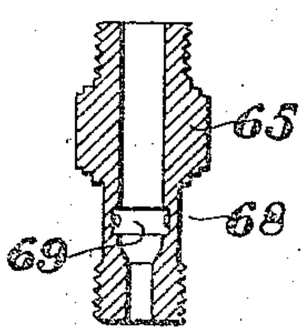


Fig. 7.

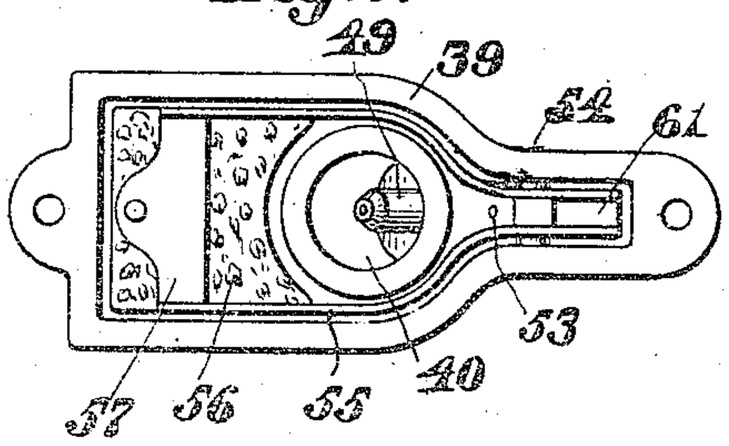
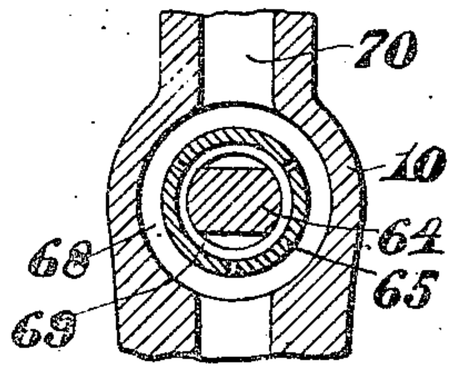


Fig. 8.



Witnesses:
Nathan C. Lombard
Howard Hanscom

Inventor:
Albert W. Menns,
by Walter E. Lombard,
Atty.

UNITED STATES PATENT OFFICE.

ALBERT W. MENNS, OF MALDEN, MASSACHUSETTS.

CARBURETER.

No. 891,219. Specification of Letters Patent. Patented June 16, 1908.

Application filed March 6, 1907. Serial No. 360,847.

To all whom it may concern:

Be it known that I, ALBERT W. MENNS, a citizen of the United States of America, and a resident of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to carbureters and has for its object the production of a device of this class for use in connection with hydrocarbon motors which is adapted to throttle the explosive mixture to a greater or less extent while at the same time the proper proportion of air and gas is maintained so that an engine may be run at any desired speed.

The invention consists in certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims to be hereinafter given.

Of the drawings: Figure 1 represents a horizontal section of a carbureter embodying the features of this invention, the cutting plane being on line 1—1 on Fig. 2. Fig. 2 represents a vertical section of the same, the cutting plane being on line 2—2 on Fig. 1. Fig. 3 represents a horizontal section of the same, the cutting plane being on line 3—3 on Fig. 2. Fig. 4 represents a vertical section of the same, the cutting plane being on line 4—4 on Figs. 3 and 5. Fig. 5 represents a vertical section of the same, the cutting plane being on line 5—5 on Figs. 1 and 2. Fig. 6 represents a vertical section of the same, the cutting plane being on line 6—6 on Figs. 1 and 2. Fig. 7 represents a plan of one of the removable float chambers. Fig. 8 represents a horizontal section through the hydrocarbon inlet valve, the cutting plane being on line 8—8 on Fig. 6, and Fig. 9 represents a vertical section of the hydrocarbon inlet valve supporting plug.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents a suitable casing or frame provided with a cylindrical valve chamber 11. The casing 10 has two openings therethrough communicating with said valve chamber 11, one of which 12 is through the top of said casing while the other, 13, passes through a side wall of said casing. Communicating with the chamber 11 are a plurality of passages or compartments 14, 15, 16, and 17, any number of which may be closed by means of the cylindrical throttle valve 18 mounted in said chamber 11 and operated by means of the handle 19 secured to the shank 20 of said valve. The handle 19 is secured to said shank 20 by means of a set screw 21 bearing against a flattened face 22 on said shank 20. Said shank 20 is provided with two flat faces substantially at right angles to each other so that the handle 19 may be adjusted so that the set screw 21 may bear on either of said flat faces 22 to permit said handle to operate the throttle valve by a movement in either direction.

The hub of the handle 19 is provided with two arms 23 in each of which is mounted a threaded adjusting pin 24 held in adjusted position by a set screw 25. The purpose of these adjusting pins 24 is to provide an adjustable device by which the movement of the handle may be limited to regulate to a nicety the limit of movement of said throttle valve in either direction, the end of said pins contacting with a fixed part of the carbureter at the end of the movement.

Adjacent to the openings 12 and 13 the casing is provided with ears 26 to which may be secured by screws 27 either the threaded coupling member 28 or a valve-supporting plate 29 that is, the member 28 and plate 29 may be positioned as shown in the drawings or their location may be reversed. This plate 29 is provided with a plurality of perforations 30 which are adapted to be closed by a valve 31 normally held in position against the inner face of the plate 29 by a spring 32 interposed between said valve and the head of a shank 33 extending through a boss 34 on said plate 29, said shank being adjustable therein to vary the tension of said spring and is held in adjusted position by the nut 35 and lock nut 36. The tension of the spring 32 is such that normally the valve will be held in closed position but under abnormal conditions a current of air will open the valve against the tension of said spring to permit the required amount of air to enter the valve chamber to mix with the gas passing therethrough. The member 28 is provided with suitable threads for attachment to a line of piping through which the mixture from the carbureter passes to the engine. When the carbureter is attached to this piping it is obvious that the carbureter may be readily removed therefrom without disturbing the piping by unfastening the screws 27 and thereby permitting the casing 10 to be separated from the coupling member 28. The lower

end of the casing 10 terminates in a flanged plate 37 to the under face of which may be secured by means of the screws 38 a plurality of float chambers 39 each of which is provided with an air inlet passage 40 extending therethrough and each communicating with one of said passages 14, 15, 16, and 17. Air is admitted to the passage 40 through the openings 41 in the extension 42. This extension 42 is provided with a cap 43 which has a central boss 44 integral therewith through which passes a shank 45 having a head 46 secured to its outer end between which and the cap 43 is interposed a spring 47 which normally retains in closed position a valve 48 secured to the opposite end of said shank 45. This valve 48 substantially closes the inlet opening to said extension 42 but under abnormal conditions the valve is permitted to move inwardly in said extension against the tension of the spring 47 to permit a greater amount of air to enter the chamber in said extension 42 and the passage 40 in axial line with said inlet opening. The chamber in said extension 42 has inclined inner walls so that as the valve moves inwardly the annular space around said valve is increased to permit the passage of a greater quantity of air. The casing in each of the float chambers 39 is provided with a nozzle 49 threaded to said casing with its discharge end extending into the center of the passage 40. The nozzle 49 is provided with the usual needle valve 50 threaded thereto and operated by means of the handle 51 to regulate the flow of hydrocarbon from said nozzle. The exterior of the threaded portion of said nozzle is provided with an annular groove 52 communicating with the interior of said nozzle by a plurality of perforations as shown in Fig. 6 and a passage 53 extends from said annular groove through the wall of the casing of the float chamber 39 into the interior compartment of said casing thereby permitting the hydrocarbon liquid therein to flow into the discharge nozzle and be discharged from the outlet end thereof when the needle valve is operated to permit its passage.

Within each of the float chambers 39 is pivoted at 54 the bifurcated member 55 having secured to its free end a suitable float 56 of cork or any other similar material. The bifurcated member 55 is connected above said float by a plate 57 with which co-acts a spring-pressed pin 58 by which said bifurcated member may be moved about its pivot whenever it may become clogged and inoperative. This operating pin 58 is mounted in a threaded member 59 provided with a relief passage 60 to prevent the air from being pocketed therein and interfering with the operation of the float. The rear end of the bifurcated member 56 has secured thereto a plate 61 providing a suitable shoulder on which rests an extension 62 of a valve 63, the upper end of which is provided with an enlarged weighted portion 64 which normally retains the valve 63 on its seat in the member 65 threaded to the flange 37 of the casing 10.

The member 65 is provided with an annular groove 68 in its periphery above the valve seat 63 and in a similar manner is provided with an internal annular groove 69 which communicates with the external groove by means of suitable radial openings extending from one to the other This weighted portion 64 is provided with one or more flattened sides which permits the hydrocarbon passing from the annular groove 68 through the radial openings into the internal annular groove 69 to pass freely lengthwise of said valve and through the opening around the extension 62 when the valve 63 is lifted from its seat.

The annular grooves 68 in the exterior of the valve-supporting member 65 communicate with the passage 70 extending from end to end of the casing 10, each end of said passage 70 terminating in an enlarged threaded portion 71 which may be connected to any suitable hydrocarbon supply pipe. A threaded plug 72 is provided to close the end 71 not in use. It is obvious from an inspection of Fig. 2 that the supply pipe may be coupled to either threaded end 71 to permit of the inlet of hydrocarbon from either direction without interfering with the operation of the carbureter. The upper end of the valve-supporting member 65 is provided with a threaded cap 73 which limits the upward movement of the valve member 64 and which is adjustable on said member 65 to vary the movement of said valve.

Should one of the float chambers 39 be put out of commission it may be removed from the casing 10 without interfering with the pipe connections to the carbureter and the valve member 64 by its weight will keep the valve closed so that no leakage will occur. Should the weight be insufficient to insure the closing of the valve it is obvious that the cap 73 may be removed and a plug inserted within the chamber 74 so that when the cap 73 is returned to its position the valve 63 will be positively retained against its seat.

In the operation of the invention hydrocarbon liquid is admitted through the passage 70 and passes around the valve-supporting members 65 in the annular grooves 68, a portion of the liquid passing through the radial openings into the internal groove 69 and as soon as the level of the hydrocarbon liquid in either of the float chambers reaches a certain point the float therein will cause the valve 63 to be lifted from its seat thereby permitting the hydrocarbon to pass into the float chamber. From the chamber 39 the hydrocarbon will pass through the passage 53 into the annular groove 52 and

through the radial openings interposed between said groove and the interior of the hydrocarbon nozzle 49 from which it will pass through the discharge outlet thereof when the needle valve 51 has been properly adjusted. The hydrocarbon in passing from this discharge outlet mixes thoroughly with the air passing through the passage 40, the amount of air being regulated automatically by the spring-pressed valve 48. This valve 48 in returning to its normal position contacts with the yielding spring 75 thereby preventing any unnecessary shock and jar. The mixture of air and hydrocarbon entering the passages 14, 15, 16, and 17 may be admitted to the valve chamber 11 as desired by the operation of the handle 19, any amount of the mixture being thus admitted either from a single passage or all of the passages. If any more air is desired to be admitted to produce a suitable mixture at this point it may be provided through the openings 30 the amount of air admitted at this point being regulated by means of the spring 32.

It is obvious from an inspection of the drawings that the casing 10 may be connected with any suitable hydrocarbon inlet pipe at either end of the passage 70 and that in like manner the discharge end may be coupled to any suitable pipe leading to the engine and that when the casing has once been thus connected any of the parts of the carbureter may be removed for repair or adjustment without interfering with the piping, which it is obvious is a great advantage.

Another advantage of the present invention is that should one or more of the float chambers be put out of commission by accident or otherwise these float chambers may be removed from the casing and the engine operated by means of those remaining. In like manner, by the removal of either of the caps 73 any one of the hydrocarbon inlet valves 63 may be readily removed without interfering with the pipe connections.

Another advantage of this device is that when the carbureter is so positioned that it is necessary that the handle 19 should be operated from the opposite direction this may be readily accomplished by loosening the set screw 21 and changing the angle of the handle to its shank 20 so that the set screw 21 may coöperate with the other flattened portion of said shank, this adjustment being readily accomplished without interfering with any other parts of the mechanism. The throttle valve operated by said handle may be moved so as to admit the hydrocarbon through one or more of the passages 14, 15, 16, and 17, as desired, thereby securing the required amount of mixture to run the engine at low speed or high speed or any intermediate speed. Again, the provision whereby the control of air to the air inlet passage is automatically regulated is another advantage.

It is believed from the foregoing description that the operation and many advantages of this invention will be fully understood.

Having thus described my invention, I claim:

1. In a carbureter, the combination of a main outlet therefrom for the vaporized mixture, a plurality of float chambers adapted to contain hydrocarbon liquid, a hydrocarbon passage from each of said float chambers, a plurality of mixing compartments each of which communicates through one of said hydrocarbon passages with a float chamber, an air inlet to each of said mixing compartments, an outlet for the vaporized mixture from each of said mixing compartments, and a valve interposed between the said main outlet and the individual outlets or passages from the said mixing compartments, said valve being adapted to cut off one or more of said compartments from the said main outlet.

2. In a carbureter, the combination of a main outlet for the vaporized mixture, a valve for controlling the output, a plurality of mixing compartments communicating with said outlet, an air inlet to each of said compartments, a hydrocarbon inlet to each of said compartments, a plurality of float chambers each of which communicates with one of said compartments and is adapted to contain a liquid hydrocarbon, and a float in each of said chambers to regulate the admission of hydrocarbon liquid thereto.

3. In a carbureter, the combination of an outlet for the vaporized mixture; a valve for controlling the output; a plurality of removable compartments communicating with said outlet; an air inlet to each compartment; a hydrocarbon inlet to each compartment; a float chamber for each compartment adapted to contain liquid hydrocarbon; and a float therein to regulate the admission of hydrocarbon to said chamber.

4. In a carbureter, the combination of a main outlet for the vaporized mixture, a valve for controlling the output, a plurality of mixing compartments communicting with said outlet, an air inlet to each of said compartments, a valve controlling the admission of air to each of said air inlets, a separate float chamber for each of said compartments, and adapted to contain liquid hydrocarbon, and a float in each of said float chambers to regulate the admission of hydrocarbon liquid thereto.

5. In a carbureter, the combination of an outlet for the vaporized mixture; a valve for controlling the output; a plurality of compartments communicating with said outlet; an air inlet to each compartment; a hydrocarbon inlet to each compartment; a float chamber for each compartment adapted to contain liquid hydrocarbon; a float therein;

a hydrocarbon inlet passage; and a valve operated by said float between each float chamber and said passage.

6. In a carbureter, the combination of an outlet for the vaporized mixture; a valve for controlling the output; a plurality of compartments communicating with said outlet; an air inlet to each compartment; a hydrocarbon inlet to each compartment; a float chamber for each compartment adapted to contain liquid hydrocarbon; a float therein to regulate the passage of hydrocarbon to said chamber; a fuel admission passage communicating with all of said float chambers; and a valve interposed between said passage and each chamber.

7. In a carbureter, the combination of an outlet for the vaporized mixture; a valve for controlling the output; a plurality of compartments communicating with said outlet; an air inlet to each compartment; a hydrocarbon inlet to each compartment; a float chamber for each compartment adapted to contain liquid hydrocarbon; a float therein to regulate the passage of hydrocarbon to said chamber; a fuel admission passage communicating with all of said float chambers; and a removable valve interposed between said passage and each chamber.

8. In a carbureter, the combination of an outlet for the vaporized mixture; a valve for controlling the output; a plurality of compartments communicating with said outlet; an air inlet to each compartment; a hydrocarbon inlet to each compartment; a float chamber for each compartment adapted to contain liquid hydrocarbon; a float therein to regulate the passage of hydrocarbon to said chamber; a fuel admission passage; a tubular plug interposed between said passage and each float chamber and provided with perforations therethrough communicating with said passage; a valve in each tubular plug; and means for limiting the movement of said valve.

9. In a carbureter, the combination of an outlet for the vaporized mixture; a valve for controlling the output; a plurality of compartments communicating with said outlet; an air inlet to each compartment; a hydrocarbon inlet to each compartment; a float chamber for each compartment adapted to contain liquid hydrocarbon; a float therein to regulate the passage of hydrocarbon to said chamber; a fuel admission passage; a tubular plug interposed between said passage and float chamber and provided with perforations therethrough communicating with said passage; a valve in each tubular plug; and a removable cap for said plug.

10. In a carbureter, the combination of an outlet for the vaporized mixture; a valve for controlling the output; a plurality of compartments communicating with said outlet; an air inlet to each compartment; a hydrocarbon inlet to each compartment; a float chamber for each compartment adapted to contain liquid hydrocarbon; a float therein to regulate the passage of hydrocarbon to said chamber; a fuel admission passage; a tubular plug interposed between said passage and each float chamber and provided with an annular external groove and perforations therethrough communicating with said passage; a valve in each tubular plug; and a removable cap for said plug.

11. In a carbureter, the combination of a main outlet therefrom for the vaporized mixture; a plurality of float chambers adapted to contain a hydrocarbon liquid and each provided with an air passage extending therethrough; a hydrocarbon passage from each of said float chambers extending into one of said air passages; a mixing compartment with which each of said air passages communicates; an outlet for the vaporized mixture from each of said mixing compartments; a valve interposed between the main outlet and the individual outlets or passages from the said mixing compartments, said valve being adapted to cut off one or more of said compartments from the main outlet; and an automatically-operated valve in said air passage to regulate the admission of air.

12. In a carbureter, the combination of a main outlet therefrom for the vaporized mixture; a plurality of float chambers adapted to contain a hydrocarbon liquid and each provided with an air passage extending therethrough; a hydrocarbon passage from each of said float chambers extending into one of said air passages; a mixing compartment with which each of said air passages communicates; an outlet for the vaporized mixture from each of said mixing compartments; a valve interposed between the main outlet and the individual outlets or passages from the said mixing compartments, said valve being adapted to cut off one or more of said compartments from the main outlet; an extension to the casing of each float chamber provided with a conical chamber; and an automatically-operated valve in said chamber adapted to control the admission of air.

Signed by me at Boston, Mass., this 1st day of March, 1907.

ALBERT W. MENNS.

Witnesses:
WALTER E. LOMBARD,
EDNA C. CLEVELAND.